Title: **Low cost at home myoelectric training using biofeedback and off-the-shelf hardware.**

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We have developed a cross-platform software package for myoelectric muscle training based on biofeedback. The package uses royalty-free methods for rendering graphics on embedded systems, reducing overall hardware requirements. These reduced requirements allow the package to be deployed on low-cost single board computers (SBC). We are currently testing the package using a Thalmic Myo Gesture Control Armband for surface electromyography (sEMG) and a Raspberry Pi SBC for signal processing and display. With this combination of devices we are able to deliver a complete system for under £200 inclusive of necessary peripherals.

The platform implements a method for conditioning of muscle activity developed at Newcastle University [1]. By only using linear filters optimal for lower levels of muscle contraction we are able to side-step the sampling rate problem typically associated with extracting muscle information from commercially available sEMG systems [2]. We present results which demonstrate that we are able to achieve comparable muscle control performance using off-the-shelf hardware as previously obtained using laboratory hardware [1].

[1] Dyson M, Barnes J & Nazarpour K. Myoelectric control with abstract decoders. Journal of Neural Engineering. 2018.

[2] Phinyomark A, Khushaba R. N & Scheme E. Feature Extraction and Selection for Myoelectric Control Based on Wearable EMG Sensors. Sensors. 2018.